(91)

Claims

[c1] A sub-sea controller (31) located under the sea level for managing a plurality of tools in a sub-sea well installation, the sub-sea controller (31) comprising:

downloading means to download an application module (35_n) to the sub-sea controller (31); and

a virtual machine (36) to execute the downloaded application module (35_n).

[c2] The sub-sea controller (412) according to claim 1, further comprising:

a native application (47) implemented within the sub-sea controller (412); and

a native interface (48) implemented within the sub-sea controller (412), the native interface (48) enabling the application module (45_n) to access the native application (47).

[c3] The sub-sea controller (412) according to claim 2, wherein

the native interface (48) enables the native application (47) to access the application module (45_n).

[c4] The sub-sea controller (412) according to any one of claims 2 or 3, further comprising:

a native memory wherein the native application (47) is executed; and

a defined memory wherein the application module (45_n) is executed, the defined memory being distinct from the native memory.

[c5] The sub-sea controller (412) according to any one of claims 2 to 4 further comprising:

a protection register, the protection register authorizing an access to the native application only if a key code is written hereinto;

accessing means to access the protection register from the application module.

[c6] The sub-sea controller (45_n) according to any one of claims 1 to 5 wherein the application module (45_n) contains a driver for a tool.

[c7] A sub-sea well installation a sub-sea controller (31) according to any one of claims 1 to 6.

[c8] A method for updating a software of a sub-sea controller (31) located under the sea level, the sub-sea controller (31) managing a plurality of tools in a sub-sea well, the method comprising:

downloading an application module (35_n) into the sub-sea controller (31); and

executing the application module (35_n) using a virtual machine (36) implemented within the sub-sea controller (31).

[c9] The method according to claim 8, further comprising:

executing a native application (47) of the sub-sea controller (42) within the sub-sea controller (412);

executing a native interface within the sub-sea controller (412);

accessing the native interface from the native application (47) to exchange data with the application module (45_n).

[c10] The method according to claim 8, further comprising:

executing a native application (47) of the sub-sea controller (42) within the sub-sea controller (412);

executing a native interface within the sub-sea controller (412);

accessing the native interface from the application module (45_n) to exchange data with the native application (47).

[c11] The method according to any one of claims 9 or 10, wherein the downloading and the executing of the application module (45_n) are performed without interrupting an executing of the native application of the sub-sea controller (412).

[c12] The method according to any one of claims 9 to 11, further comprising:
executing the application module ($4S_n$) in a defined memory;
executing the native application ($4S_n$) in a native memory,
wherein the defined memory is distinct from the native memory.

[c13] The method according to anyone of claims 8 to 12 wherein the application module ($4S_n$) contains a driver for a tool.